







THE  
ARGENTIC GELATINO-BROMIDE  
WORKER'S GUIDE,

OR

HOW TO PRODUCE PERFECT SPARKLING NEGATIVES IN THE  
SHORTEST TIME, WITH THE LEAST TROUBLE AND THE GREATEST  
CERTAINTY; WITH INSTRUCTIONS FOR USING

THE NEW ARGENTIC BROMIDE PAPER

FOR RAPID POSITIVE PRINTING;

ALSO HOW TO MAKE TRANSPARENCIES; MAGIC LANTERN SLIDES;  
IVORY-TYPES (OR THE EBURNEUM PROCESS); ENLARGEMENTS  
ON OPAL, PAPER, AND CANVAS; BESIDES MANY WRINKLES OF AN  
OLD PRACTITIONER: BY

JOHN BURGESS,

*The Originator of Washed Gelatino-Bromide Emulsion, Pellicle,  
Dry Plate, &c.,*

ILLUSTRATED BY SPECIMENS OF INSTANTANEOUS PHOTOGRAPHY  
PRODUCED BY

W. T. MORGAN & Co.'s

*New Argentic Gelatino-Bromide Plates, and New Method  
of Development.*

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	PAGE:
INTRODUCTION . . . . .	5
INSTRUCTIONS . . . . .	9
THE DARK ROOM . . . . .	10
CHEMICALS AND APPLIANCES REQUIRED . . . . .	13
ON DEVELOPMENT . . . . .	16
PROPER EXPOSURE . . . . .	21
OVER EXPOSURE . . . . .	25
UNDER EXPOSURE . . . . .	29
FERROUS OXALATE DEVELOPMENT . . . . .	31
REDUCING THE DENSITY OF FILMS . . . . .	34
ON THE VARIOUS APPLICATIONS OF GELATINO-BROMIDE . . . . .	35
TRANSPARENCIES . . . . .	36
ON THE USE OF ARGENTIC BROMIDE PAPER . . . . .	39
HOW TO PRODUCE PAPER NEGATIVES . . . . .	44
DESICCATED EMULSION . . . . .	45
IVORY-TYPES . . . . .	46
TO MAKE ENLARGEMENTS ON CANVAS . . . . .	49
ENLARGEMENTS, &C., ON OPAL . . . . .	50
OUR NEW METHOD OF DEVELOPMENT . . . . .	51
MEMORANDA . . . . .	55







## INTRODUCTION.

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It is now seven years since I introduced an entirely new process for dry plates, having taken a decided departure from the established routine of photographic work, and I ventured then to predict that the advantages offered by the new process were so numerous and so great, that eventually it must supersede the bath and collodion. My expectations are now in a fair way of being realised. The largest manufacturers of collodion have long been convinced that their craft is in danger, and have wisely taken to the manufacture of gelatine emulsions. Twenty years ago I was working hard at dry plates, and for a long time followed the lead of eminent men, ringing the changes with great perseverance on the endless variations of formula recommended in the journals. I have vivid recollections of the messes I made in imitation of other photographic messers, but no advance was made until it occurred to me that the real cause of the slowness of the dry plates was the imperviousness to moisture of dry collodion. It seemed to be quite clear to me, and doubtless to many others, that what was wanted was an absorbent film, easily

penetrated by the developing solution. I tried various forms of starch, gum, albumen, and gelatine, and soon became convinced that the latter was the right substance. There were difficulties to overcome, but when once it appeared that great rapidity, wonderful simplicity, and most blessed cleanliness, were the distinguishing virtues of gelatine, difficulties had to give way, and one after another they vanished. The washing out of the potassic nitrate was accomplished easily and in a few minutes, and the emulsion was reduced to a pellicle by desiccation for the purpose of keeping it. Others have been credited with the invention of these details, and they were announced as improvements on my method; but it is well known by several gentlemen, that from the beginning I practised in the so-called improved way, and produced plates quicker than with wet collodion, and capable of any degree of density.

It is a great pleasure to me to see the truth of the statements I made in my original announcement so generally recognised. The objections which hasty persons pronounce against gelatine plates fade away with experience. Photographers who have been in the habit of doing good work easily by the old system, fancy that they know all about it, and if everything does not go right in their hands, the fault, they think, must be in the process. They forget how long it was before the excellence they are familiar with was attained. Let any one take up a Manual of Photography and look over the chapter on failures, and see what a formidable list of difficulties had to be surmounted before that chapter could be written. It would be impossible to make such a list



with reference to gelatine plates because of its great simplicity, and the few causes of failure which operate to defeat the tyro are every day becoming better understood; and now, after seven years of practice, our apprenticeship is ended, and we are able to set up as masters of this beautiful process, and respectfully offer to our readers instructions which they may rely upon with the utmost confidence. Many crude and ill-considered suggestions have been made (by experimentalists who have rushed into print), and have led the unwary into pitfalls which have disgusted them; but what is here written is the outcome of much toil and thought, and is the exposition of a method of working which has proved highly successful.

It is a great satisfaction to me to announce that in the early days of Argentic Gelatino-Bromide, I found a sympathising worker in Mr. W. T. MORGAN, of Greenwich, a practical and skilful photographer, doing a high-class trade, and with whom I am now commercially associated—to him, and his manager Mr. R. L. KIDD, I am indebted for many valuable hints, which immensely enhance the utility of this little book. They entered into the matter with the most business-like views, and step by step put everything to the test, and performed thousands of experiments to find out and put on record the exact conditions of success. The result is, a plate has been produced and a method of working adopted, which leaves the bath and its worries far behind, while the manipulations are performed with a degree of comfort and ease which leaves the mind free to think of the requirements of art, and which conduces

to that serenity of demeanour which is so pleasing to the photographers' clients. But what will be considered a more important matter still, is that the average excellence of work done, both in the studio and out of doors, is far higher than when the Bath and Collodion were in use. That this is nothing but an unvarnished statement of fact any one may be convinced who will do us the honor of inspecting our album of specimens containing hundreds of portraits taken under circumstances favourable and unfavourable, in winter and summer, on bright days and dull days. We consider this album an unanswerable argument to the detractors of gelatine plates, and challenge comparison with any similar number of specimens of every-day work done with collodion. Here are a number of vivacious babies, rendered as they never were before, for while motion is apparent there is no blurring of the details, and you have beautifully-modelled features and well-rounded limbs, and all secured without that fearful trial of patience, and exhausting toil which aforetime made the dear baby the bogey of the studio.







## INSTRUCTIONS.

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Respected reader, will you kindly suffer a few words on the spirit in which you should commence your study of this charming process.

You want to succeed, and I too am anxious that you should do so, I will therefore venture at the commencement to remind you of the words of a great man who said that "Trifles make success,—but that success is no trifle." In fact, the person who is determined to succeed regards no direction, however minute, as a trifle. "He that is faithful in that which is least is faithful also in much," is a maxim which is the foundation-stone of photographic art. I will ask you then to go patiently through every sentence and though at times you may feel disposed to vote me tedious, I am sure you will thank me in the end for making the path smooth and straight for you.

I shall give no instructions for making your own emulsion, because it will be far cheaper, now you can get it at a moderate price, to buy it. We shall begin then with THE DARK ROOM.





## THE DARK ROOM.

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Here all the delicate operations of development will have to be conducted, and it should be fitted up with every care. There should be a sink and water-tap over it, and shelves arranged for the necessary chemicals. Have a place for everything, and keep everything in its place; and as this is a hard rule for some persons to observe, though it comes naturally to those who are trained to it, I would advise those who know themselves to be lax in this particular, to contrive things so that it will be difficult to put them in the wrong place. Do not have any superfluous shelves, and anything that can be tied to a string and a nail (such as a camel's-hair brush for dusting the plates with before putting them into the dark slide), let it be done. Have a place for your dark slide, your Hypo bath, your Alum bath, and your developing tray. If you are conscious of untidy habits, give them as little chance as possible of thwarting you by every contrivance you can think of for keeping things in their places.

Now, although the operating-room is called a dark room, get all the light you can into it, but mind it is of the right sort. If you have a window exposed to the sun, block it up entirely, and use artificial light; but if the sun cannot shine on your window, then cover it with two thicknesses of orange-colored paper; this can be

made sufficiently deep in color by painting any good yellow paper with aurine dissolved in methylated spirit—1oz. of aurine dissolved in 4oz. of methylated spirit, applied with a camel's-hair brush. This must then be rubbed over with boiled oil to make it semi-transparent. But a suitable material for covering your window can be bought at any photographic dealer's, and perhaps the safest way will be to get it there.

When you have your window nicely covered you should test its quality. To do this, shut the door, look carefully round the room to see if you can discover light coming from any crack or crevice in the door, or any other place; and in order that you may the more easily discover any stray rays of light, darken the window. When you are satisfied that any accidental source of light has been effectually stopped, take a plate from your box and expose one-half of it to the light of the window for three minutes, and let it be placed as near to the window as you would hold it while operating; cover one-half with a card, or anything to keep the light from falling on it. When the three minutes are up, put the plate in your developing dish and pour the developer over it, let it stay for one minute, then take the plate out, wash it, and if the two halves of the plate are alike, your light is right; but if the half exposed darkens, that is a proof that your light is not sufficiently non-actinic, that is, it must be of a deeper orange. To make it so, put another covering of yellow paper painted with aurine and boiled oil as before; now, repeat your experiment with a new plate and you will find it right. It is convenient to have a roller-blind of



yellow calico or ruby union, which may be drawn down during the exposure of a very sensitive plate, and up as soon as the details are well out. By this plan you can use more light for the other operations.

Having arranged your window satisfactorily it is advisable to fix up a lamp, to be illuminated with artificial light; use gas if you can, let the lamp be at least one cubic foot in dimensions, and have three sides covered with the orange paper. You will be able to examine your negative more closely than it would be safe to do by the window, as you can hold it close to the lamp, and thus estimate the density of your negative to a nicety. Your lamp must have a chimney to conduct the hot air and smoke out of the dark room. It is not necessary to have both a lamp and a window, many prefer always to work by a lamp as being the safer light, but the window has its advantages. Have the two if you can.

We have a large condensing lens, stained with ruby medium, about 5 inches in diameter, fixed in the front of our lamp; this enables us to concentrate the light upon the negative, and to illuminate the densest parts, so penetrating them that it is easy to judge when they are of good printing intensity. This is a matter of very great importance, and the complaint usually made that gelatine plates must necessarily be uncertain because of the difficulty of seeing the progress of development is of no weight with us, for by proper arrangements the operator may have all needful light at the proper time.







## CHEMICALS & APPLIANCES REQUIRED.

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Protosulphate of Iron, 2d. per lb.  
Oxalate of Potash, 2s. 4d. per lb., 3d. per oz.  
Pyrogallic Acid, 2s. 6d. per oz.  
Liquid Ammonia 880, 9d. per lb.  
Bichloride of Mercury, 3s. 6d. per lb., 4d. per oz.  
Iodide of Potassium, 1s. 6d. per oz.  
Hyposulphite of Soda, 3d. per lb.  
Cyanide of Potassium, 1s. 4d. per lb.  
Nitrate of Silver, 3s. 6d. per oz.  
Citric Acid, 3d. per oz.  
Chloride of Gold, 1s. 10d. per 15 grains.  
Common Alum, 2d. per lb.  
Bromide of Potassium, 4d. per oz.

You should have in addition to the above stock of chemicals,—two vertical baths and dippers, suitable to the size plate you intend to use; three dropping bottles; ebonite dish for developing; graduated measures, two or three; a light tight plate box; some use dishes instead of the baths and dippers, but the baths are far more convenient.

When you have your chemicals and vessels ready, make up the following solutions and distinctly label

them. It is a good practice to use bottles in the operating-room as much unlike each other in shape and size as possible, this will help you to recognise each solution at a glance and even by the touch; mistakes cannot very easily occur if such precautions be made. Do not presume too much on good resolutions, they are very apt to fail in a moment of excitement. When you are perfectly calm therefore provide against mistakes, and do all you can to make it impossible to go wrong.

#### SOLUTION A.

Pyrogallic Acid 6 grains.

Water 2ozs.

Prepare sufficient of this for one day's work only.

#### SOLUTION B.

Water 2ozs.

Ammonia 1oz.

Bromide of Potassium 1 dram.

Keep in a dropping bottle.

In hot weather increase the Bromide to  $1\frac{1}{2}$  drams.

#### SOLUTION C.

Bromide of Potassium 30 grains.

Water 1oz.

#### SOLUTION D.

Hyposulphite of Soda 4ozs.

Water 20ozs.

Keep this in a vertical bath.



## SOLUTION E.

A saturated solution of Alum.

This should be kept in a vertical bath.

## SOLUTION F.

A saturated solution of Bichloride of Mercury. To make this,—pound an ounce of Bichloride of Mercury to a powder, put it in a clear transparent bottle with 5ozs. of water, and shake it up thoroughly, you will find that only a small part of the Bichloride will dissolve, a large part of the powder will remain at the bottom. When you want to use this solution,—pour off the clear liquid and leave the undissolved powder at the bottom, then fill up your bottle with water, shake well, ready for another time; you may do this over and over again, so long as any powdered Mercury remains at the bottom; but to make sure that the solution is saturated always see that there is, after a good shaking, some sediment at the bottom.

## SOLUTION G.

Take 5ozs. of F,—that is your saturated solution of Mercury, and add to it 3 drams 35 grains of Iodide of Potassium; shake well. At first a bright red color will appear, and by the time all the Iodide of Potassium is dissolved it will, as if by magic, disappear, and the solution will become perfectly transparent and clear. You now have your INTENSIFIER. Label it as such.

Other developers and intensifiers will be described in another chapter; but now you have all that is necessary for commencing work, and I will describe the way to use them before proceeding with the other methods.





## ON DEVELOPMENT.

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To understand the principles as well as the practice of development is very desirable, I will therefore enter into a few explanations as briefly as possible. When a sensitive plate is exposed in the camera to light no visible impression is made upon it, and yet many parts of the sensitive compound have undergone a great change. Before light struck upon the Bromide of Silver it was not capable of entering into chemical combination with substances in the developer, but, as soon as any part of the film has been exposed to light it is capable of such chemical combination. But all chemical combinations take place in definite proportions, therefore the extent to which any part of the film will be acted upon depends upon the amount of influence exerted upon it by the light. And if we could exactly measure the force of light we could always tell beforehand what strength of chemicals would properly develop the picture, but as we cannot do this because the light is constantly changing, and no two objects reflect light to the same degree, we have to depend upon judgment, and your judgment must be carefully

cultivated by close and constant observation. It is astonishing how accurately an experienced person of intelligence will be able to calculate by merely casting his eye round the object he is about to photograph, the right exposure and development. When some persons look upon the beautiful productions of an expert in photography, they seem to fancy he has some secret process, or some artful dodge not known to the outer world, and they immediately commence stratagems, not at all artful, to worm the secret out of him, and, with great simplicity they ask, what plates do you use? and whose lenses do you like best? and what formula do you develop by? &c., &c., and they suspect he is gulling them when they hear nothing but what they are familiar with.

It cannot be too urgently impressed upon the readers' minds that chemicals are no respecters of persons: Nitrate of Silver, Bromide of Ammonium, or Pyrogallie Acid, will do for one man just what they will do for another. Learn all you can about every chemical you use: how it is made, what its properties are, and what combinations it is capable of. You will then be able so to use them with good effect. KNOWLEDGE IS POWER, and it only requires to know all about your material and the laws which govern their action one upon another, to have a perfect mastery of them. I therefore do not think it sufficient to give you a list of chemicals and a set of formulas, and tell you how to manipulate your apparatus, but think it far more useful to point out the shortest way of gaining sound experience, to which you can refer in cases of difficulty.



Take nothing for granted; prove all things; hold fast to that which is good. Do not be content with reading these lines, but actually and faithfully perform the experiments recommended. It will pay you a hundred-fold. Put a curb on your impatience, and offer up a few dozen plates in sacrifice to first principles. You will learn more by trying the following experiments in one morning than you would by a month's desultory practice.

Make a diagram, consisting of twelve squares, arranged thus:—

1	2	3	4
5	6	7	8
9	10	11	12

Let it be about 8in. long and 6in. wide, that is, each square must be 2in.

This will about cover the space a life-size head would occupy. Now rub up some Indian ink in a saucer, and put the lightest possible tint on No. 2 square, leaving No. 1 quite white, deepen the tint a little, and cover No. 3, then add more ink and cover No. 4, and so go on covering square after square, making each one darker till you get to No. 12, which must be as black as you can make it. Now you have a nice gradation of tints ranging from pure white to the



deepest black, and every sparkling picture must have this range of tints with hundreds of intermediate ones, but of course arranged with nature's beautiful variety and seeming carelessness; it must be your aim to secure a faithful register of every gradation of tint. Now to learn how to do it. Put up this diagram and photograph it several times, giving a different exposure each time, but the same development; and when I say the same development I mean you should not only use a developer of the same strength, but let the development be continued for a certain fixed time, say one minute, for time is an important element. And now I am speaking of elements it will be well to explain here the part which each ingredient of the developer plays. You have Water, Pyrogallic Acid, Ammonia, and Bromide of Potassium.

The water simply dilutes the others and renders the action less energetic in proportion to the quantity used.

Pyrogallic Acid is the real developer. A picture can be developed with pyro alone, but it would be a long time doing it. You may use any strength of pyro from half a grain per ounce to ten grains per ounce, but the result would be very different. This difference is a very important study. It is a strange thing that the peculiar action of pyro should have been overlooked by nearly all workers and all writers on the gelatine process. I suppose that certain fixed ideas have gained possession of men's minds respecting this important agent, which have prevented them from thinking about it, and they have gone on playing the game of follow-my-leader blindfold, holding on to the tails of those who

have gone before, so that we have heard nothing but obscure hints of one of the most valuable properties of Pyrogallic Acid. It is a remarkable thing that though there has been a great outcry for density—more density! that none of the makers of plates, nor writers in the Journals should have pointed out the fact that Pyrogallic Acid has the power of conferring this quality to any extent. *The more pyro you use in your developer the slower it will be, but what you lose in quickness you gain in density.*

Now, with the iron development in the old wet process, the more iron you use the quicker the development is and the thinner the negative is. How can we account for the difference? Why the explanation is simply this—Pyrogallic Acid has a special action upon gelatine, it tans it, converts it into fine leather, renders it insoluble, and so acts as a restrainer. The astringent power of Pyrogallic Acid contracts the colloid substance of the gelatine, so that the aqueous solutions cannot pass so freely amongst its molecules. This property of Pyrogallic Acid can be turned to good account in the process of development, as you will see further on.

The next important element is Ammonia. This must be used with great caution. It is the stimulator, and stimulants are always dangerous. The more Ammonia you have in the developer, the quicker its action is. It is very nice to see a picture pop out quickly, and sometimes very tempting to hasten matters by a few drops, but it is like a skittish colt impatient of control—beware how you use the whip! A steady pace is best, not crawling, not dashing. It is the aim of all



good photographers to regulate their developer, and the standard should be one that can be checked before irretrievable mischief is done, or accelerated if too slow.

Bromide of Potassium has no developing power,—very good pictures can be taken without using it at all in the developer, indeed cases often occur when it is best left out, but in general practice it is useful to check the developer, and make it slow enough to introduce a change before development is completed, if any indications should appear to make a change desirable.

Having made these preliminary explanations we will return to our diagram and resume practice, where we shall learn in a practical way how to take advantage of the facts just stated. Firstly, we will treat of a *properly exposed plate*—that is, a plate that with one application of the developer will give a good negative. Secondly, we will show you how to manage an over-exposed plate; and Thirdly, the best way of treating a case of under-exposure. Of course you will always aim to give exactly the right time to the fraction of a second, for that is the way to attain the highest excellence, and if you are ambitious to distinguish yourself among photographers, just invent a contrivance for showing the right time to give in any case. Many have tried to do this, but up to the present time we are left to our own judgment, guided by experience. Let us then make the best we can of it. You have your diagram fixed up and focussed, and a new batch of plates of unknown sensitiveness; you carefully take one from the dark box, dust it with a soft camel's-hair brush, put it in



the dark slide, place it in the camera, and all is ready for uncapping the lens. Now, how long shall the exposure be? Well, we will suppose you have a good light, a good lens, and a good plate. Your lens has a medium stop in it, try half a second to begin with! Take the cap off and put it on again as quickly as possible.

Now, go into the dark room, put your dark slide in the place prepared for it, while you mix your developer, which is to be a standard one, that is, a one of medium quickness; first drop 6 minims of your Solution **B** into the developing cup, and then put 2ozs. of **A** take the plate from your dark slide, put it into your developing dish and instantly flow the developer over it; do not wet the plate first, if any air-bubbles appear on the plate, touch them with your finger, or keep a soft camel's-hair brush at hand, such as a gilder's mop, and sweep them away. To do this, occupies much less time than to read it. The moment the developer has covered the plate is the time to be wide awake, for it will soon be seen whether the plate is rightly exposed or not; if it has, nothing will be seen for ten seconds, then in one corner a black square will begin to appear, faint at first, but every moment getting darker; then in a second after No. 2 square is seen, then No. 3, then No 4, so one after another they appear, but apparently with more reluctance, and at the expiration of one minute or thereabouts all the tints in due order have come out, but the reverse of the diagram, No. 1 is quite black, No. 12 is quite white. This is quite right. The moment this state of the plate is arrived at, throw the developer

down the sink and wash the plate well, give it plenty of water to eliminate every atom of the developer; now have a good look at it, and consider well whether it is dense enough. It will take a great deal of practice to be able to determine this, and a very critical thing it is at all times to decide this point. It is not too much to say that no part of the process is so severe a test of a man's judgment as this. You can go on and make the negative as dense as you please, but there is a point where it is best to stop, and you can only tell by close observation and many trials; but take it as a general rule that when you have given the right exposure, the development is gradual and regular, and completed in about one minute. We are supposing now that you have fortunately hit the time exactly right, and consequently a minute's development has given you a perfect negative; you have given it two minutes' washing under the tap, now put it on your dipper and plunge it into the Alum Bath. Never omit this,—it hardens the film, stops all blistering, neutralises any trace of the Ammonia that may have been left in the film, and you can examine it afterwards with more light, as now it is not sensitive. After soaking for two minutes in the Alum solution wash it again and then put it in your Fixing Bath, let it stay till all the white Bromide of Silver is dissolved and you can look at your squares. The white square has become transparent glass. To make sure that all is dissolved let it stay a minute or so after it appears to be gone. Now the plate is to receive its final washing—let it be a thorough one, for every atom of Hyposulphite must be removed from the film if you wish to keep the negative.



Every vestige of the picture would fade away if the hyposulphite were not washed out, give it therefore two minutes under the tap, and at least ten minutes' soaking in a dish or bath. We keep a grooved zinc box full of water to receive the plates after washing, and there they stay often for hours—this does them no harm, and it ensures perfect freedom from the dangerous hyposulphite, as we have a self-acting syphon which ensures a constant change of water. There is another advantage in this system of ours—they remain in the best condition for a final examination. After the hurry of the day's work is over, and there is plenty of time to examine them as deliberately as we please, we can give them a touch-up with the intensifier or reduce them if they require it; but as I am now supposing we have a perfect negative, I must say nothing upon that subject just yet.

After washing, comes the drying. Let the plates drain on a rack carefully screened from dust, and dry spontaneously. If you wish to hasten the drying you can do so by immersing the plate a minute or two in methylated spirit, when after draining you can dry it off by the fire, taking care that the plate does not become hot; it will not stand that, but a gentle warmth will speedily evaporate all moisture.

Proof-prints may be taken with safety previous to varnishing in dry weather, but when it is damp a thin piece of talc or papier mineral should be interposed between the negative and sensitive paper to prevent the free silver from damaging the film. Here is a hint or two which may save you some trouble. Warm your plate



before applying varnish, and if you are about to varnish a number, a small jug is much handier than a bottle, as you can pour the excess back much easier. I was about to say pour the varnish on to the warm plate in the same way as Collodion; but as a generation is springing up who know not Collodion, I will, for their sakes, say how it used to be done in the ancient times. Pour a little pool in the centre of the plate, then tilt the plate so as to cause the varnish to flow to the corners, but not over them, and as soon as the plate is covered pour off all that will run off, rocking the plate so as to prevent it from running in ridges. While this is being done protect your plate from a draught of cold air, or you will have it chilled, and it will set with a surface like ground glass, instead of patent plate.

Now we have come to our Secondly,—*an over exposed plate*. And you may have this in the twinkling of an eye in some conditions of light, at other times you may expose for hours and not overdo it, but you can always tell when more light has touched your plate than is suitable to your standard developer, by observing how the picture comes out; instead of that orderly and serene fashion described in the perfect exposure, tint following tint in stately procession, there is a rush as if all the tints were trying which could be first. And in order to make the case quite clear, just put up your diagram and photograph it once more, give it as long again as you gave it when you got the perfect negative. Now what do you see? As soon as the developer is over the plate, No. 1 square starts out, it does not wait till you have counted ten, and No. 2 will

be after it like a shot; but you must stop this gallop, dash some water on it, wash the developer off sharp, there is no fear of your film coming off—water is cheap, don't spare it. Now then, what was the matter? You have a plate on which the light has made a very vigorous impression, so vigorous indeed, that if you allowed matters to go on as they commenced you would have had No. 6 square as black as No. 1 ought to be, and instead of that beautiful gradation of tint from deep black to pure white, you would have a flat ghostly-looking image devoid of contrast and force. The developer you started with was too strong, so you must make it stronger! here is heresy for you. It will make some of the old photographers' hair stand on end. Well, never mind them, do as I tell you. Just mix up your developer afresh, and instead of using 3 grains of Pyro per ounce use four or five, give an extra three or four minims of Bromide from your dropping bottle C, and two or three less from B, and pour this over the plate; and now what do you see? why the tints coming out as crisply and as regularly as possible. The Pyro has acted on the gelatine, closed up the pores, and while it acts slowly it does so powerfully, and instead of a poor half-starved ghost, you get a blooming, sparkling negative that makes your eyes dance in your head. But, I am sorry I must damp your ardour with buts, yet Photography even with Argentic Gelatino-Bromide Plates cannot get on without ifs and buts; then I will say, but you must be cautious in modifying your developer—nothing but experience can teach you to what extent you may do this. All I can say to you on



this point is, get your experience as cheaply as you can, and I believe the best way to do this is to stick to your diagram till you can get an exact copy of it on paper,—take a print from each plate at first, and notice the time it takes to print. The appearance of gelatine negatives is so deceiving to those who have been accustomed to collodion, that nothing but actual trial can convince them of the extraordinary printing power of very thin films. The universal tendency with beginners is to get too much density, and you will be able to perceive the nicety required and the difficulty to be overcome, better by photographing the diagram of graduated tints than in any other way, because in a negative of that you have the principal light concentrated in one square, and that one the first; then next, divided by a clearly defined line, you have a very slight gradation. Now the difficulty you will meet with will be to preserve the slight distinction between the squares at either end of the scale: if you get too much density, Nos. 1 and 2 will appear in the print alike, or if you go on printing till the distinction between these slightly different tints are marked, you will find the distinction between the last two squares obliterated; and here allow me to remark, it is in the careful preservation of these minute shades of difference that the true Artist distinguishes himself. In every portrait and view there are gradations so subtle that the eye cannot follow them, the mind feels their presence and rejoices—it misses them and is dissatisfied. The Mechanical Photographer gets a map of his subject and is content,—to him the subject I am writing upon is all Greek, but you, my



attentive reader, may consider when you have learned to get a print of those uninteresting squares, with the first two distinct as well as the last two (and I am supposing that there is only just difference enough in the diagram for the eye to distinguish them), you have achieved a success which will make your rendering of the face of nature or the human countenance a thing of beauty and joy for ever (*if your work lasts so long*), and you put the same skill and discrimination into them.

After this little lecture let us have a look at our negative again and suppose a slightly different case, and I will suppose what is very likely to occur,—you were not so quick in recognising the signs of over-exposure as you will be after more practice, so that despite your change of developer, the image is rather flat and weak; it is all there, tint after tint, but there is a lack of density, your print would not have any pure white in it. Now you must resort to what is called intensification after fixing. Put 1 dram of Solution F (Iodide of Mercury Solution) into a clean developing cup, add 1oz. of water; now take the negative in your hand, which I suppose has been copiously washed, hold by one corner and in such a position that the light can be reflected through it so as to show the effect of the Iodide of Mercury. If the Solution turns of a milky appearance as soon as it has flowed over the plate, it is an evidence that you have not washed your plate sufficiently, some of the Hyposulphite has been left in the film and it precipitates the Mercury. In this case dip your plate again into the fixing bath and wash thoroughly, apply some fresh Solution and watch its

effect, you will soon see if the strength of the Solution is sufficient to accomplish your purpose; in a few seconds the dark parts will have become darker, but perhaps not dark enough, if so, add a few more drops of the Iodide of Mercury Solution, and if that does not do it try a few more, but beware of going too far, it is easy to get any amount of density, and too much is fatal to good work; it must be remembered that it dries much darker, and that this intensifier does not pile up the film, it merely changes the color of the darker parts. But I repeat again that experience is the only teacher from which you can learn to hit the happy medium. This plan is used when only a little additional density is required. If much is wanting, then silver intensification must be resorted to, but it is only necessary when a very great error has been made in exposure.

There are other modes of intensification which will be noticed hereafter, but this is the simplest and most cleanly.

We will now enter upon the consideration of our Third case, ONE OF UNDER-EXPOSURE, and when we speak of *under* and *over* exposure we do not mean absolutely so, because nothing can be done with a plate that has had too much or not enough light for development; we speak now of a plate that is not sufficiently exposed to bring out all the details of the picture in full strength with one application of the standard developer. A case of under-exposure then in this sense is recognised by the slowness with which the picture begins to appear, instead of the proper ten or fifteen seconds nothing is seen of the picture for twenty or thirty seconds. It is



plain, therefore, that it wants a little whipping-up, a little stimulating; therefore, drop three or four drops of B into the developing-cup and pour the developer back upon it, this will effect a thorough mixture, then pour it over the plate again, look out for air-bubbles as before, and disperse them if they rest on the plate. Now development will go on more briskly, but if the exposure has fallen considerably short it may require the dose of stimulator repeated two or three times, but always do it cautiously. If you go too far you will fog the plate, it is rarely safe to add more than twenty drops of the B Solution to an ounce of A. I may explain for the sake of beginners that fog is a discoloration of the whites of the picture; therefore, keep your eye upon those parts of the picture which ought to be clear glass when fixed, and as soon as you perceive the slightest tendency in these parts to darken, stop development; you have gone as far as you safely can. Fog shows itself as a yellowish veil over the transparent parts of the picture. A very little of it may be tolerated, its only effect is to cause the negative to print much slower than when clear and bright.







## FERROUS OXALATE DEVELOPMENT.

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The Ferrous Oxalate is comparatively new as a developing agent. It has its merits and its drawbacks. Simplicity of working is its chief recommendation; but it is expensive, slow, and not under control to anything like the same extent as the Pyrogallic Acid. This is a serious indictment against Ferrous Oxalate, in our fitful climate. It is impossible for the most skilful and experienced operator to guess the time exactly on all occasions; it is, therefore, an immense advantage to have the means of compensating for a slight deficiency of light by an increase in the power of the developer. Now the Oxalate is not so elastic in this respect as the Pyro, and therefore not so generally eligible; and yet many will prefer it, and think its simplicity makes ample amends for all its faults: we therefore give the formula, and directions for mixing.

Add one part of a cold saturated solution of Protosulphate of Iron to three parts of a saturated\* solution of Oxalate of Potash, pour the solution of Protosulphate of Iron into the solution of Oxalate of Potash, stirring all the time. Notice the order in which

\* Saturating point of Oxalate of Potash—one to four of water.

Saturating point of Protosulphate of Iron—one to three of water.

we recommend you to mix, because it is important. The mixture forms Ferrous Oxalate. Now, Ferrous Oxalate is soluble in an excess of Oxalate of Potash, but is precipitated in the form of a yellow powder if there is not an abundance of Oxalate of Potash. By observing the order above, you will secure this excess, and your solution will be clear and bright.

To use Ferrous Oxalate you have merely to put the exposed plate in the solution, and leave it until it is done. You can take it out to examine it as often as you please, and the same quantity of developer can be used several times, but it rapidly oxidises and deteriorates, becomes thick and muddy, and slower; as soon as this stage of decomposition is reached it must be rejected, and a fresh quantity made.

NOTE.—In case of over-exposure, when you wish to retard the action, a little Bromide of Potassium will do it, say ten drops of a 30-grain solution.

I will give a caution here respecting the apparent density of negatives developed by Ferrous Oxalate. It is often said in praise of Ferrous Oxalate negatives, they look so much like a wet plate. Yes, but they are never so dense as they look; and persons are often surprised at the poor prints they get from such vigorous-looking negatives, and they blame the paper or scold the printer. The fact is, the colour is not favourable to vigor; it is actinic. The Pyro-developed plate is the reverse of this; it looks weak when in reality strong. These things should be remembered. It is desirable to master one method thoroughly before attempting another,



There is another hint I will give. It is a good plan to take a print before varnishing your negative; you then bring it to a practical test. The eye must be well trained before it can be depended on to judge without this aid. If, after printing, it appears that a little more density would have been an advantage, it is easy to get it by repeating the intensifying process, or, if too dense, here is a way of REDUCING FILMS, and a very important wrinkle this is; it is one of the things not generally known. There are plenty of ways of doing it in the old photographers' note-books; but they all do too much, or too little. This plan is under perfect control, and, when well understood, will redeem thousands of negatives from destruction.





## REDUCING FILMS.

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Make a solution of Chloride of Gold, one grain per dram of water. After well washing the negative, flow the solution over the plate; a change of colour will be seen to take place: if the density wants reducing very much, let this change of colour go on until it can be seen at the back of the negative as well as the front. Then wash and flood the plate with a solution of Cyanide of Potassium. This will dissolve out the Chloride of Silver that has been formed; and by repeating the process, never forgetting to wash well between each application of a fresh chemical, you may reduce a negative as much as you please.

Cyanide alone, that is, without the previous application of gold, attacks the weak parts of the picture first, and makes matters worse by increasing the contrast; but by this plan the film is equally reduced throughout, and thus the harmony of the picture is preserved.





ON VARIOUS APPLICATIONS OF  
ARGENTIC GELATINO-BROMIDE.

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Hitherto the use of Argentic Gelatino-Bromide has been confined to the negative process,—its marvellous rapidity and delicacy has outstripped all rivals in the camera, and it is destined to play a still more important part in the production of the positive picture, and to extend the photographer's business to much wider fields of enterprise than have yet been open to him. He need not be in future the minister of vanity, but may aspire to a much more important place as a promoter of trade and commerce, of art and science.

As Iodide of Silver has had to give place to Bromide so will the Chloride and probably the Carbon print. There will not be that anxious waiting for the weather which has been in times past the bane of English photographers. A better time has come for our profession, all who are wise will be ready for the flood tide and float joyously on to fortune. The bickering doubters will halt and hesitate till the opportunity is passed, and go puddling all their lives in shallows.

Let every photographer learn to make the most of Gelatino-Bromide, and his lot will be a happier one than of old.

We now propose to point out some of the most valuable applications of Gelatino-Bromide, and, first, we will speak of TRANSPARENCIES.



## TRANSPARENCIES.

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Every practical photographer knows the difficulties of getting a perfect transparency by the old processes. Bath, developer, and light must all be in their rarest condition, and exposure timed to almost superhuman nicety, at all events, to a nicety too great for ordinary human nature. The carbon transparency is fine, but slow, and rather too difficult for the multitude; but with good gelatine plates the making of a first-rate transparency requires nothing more than the most ordinary intelligence, and can be done with one-fifth the trouble and time required by any other process. A single jet of gaslight, a paraffine lamp, or even a candle is sufficient; indeed, artificial light is much better for this work than daylight—you can regulate and measure it to suit your purpose to the greatest nicety, and as so much depends upon the strength of light used I insist the more emphatically on the necessity for having the best arrangement possible for illuminating your negative. It is often the case that formulæ are given for special plates and special developers for making transparencies, while the strength of light used is never



indicated; no wonder, therefore, that great disappointment is felt by those who fail to get the excellent results promised. When you have achieved a success in photography, take every circumstance connected with it into account if you wish to do the same again. I mention this that my readers may not think that it is only necessary to get a good plate to ensure a good transparency. It is easy to fail if you disregard the conditions of success; fortunately these are well known and easily practised.

Transparencies should always be on patent plate; no other glass is flat enough to ensure that perfect contact between the surface of the plate and negative which there ought to be.

Transparencies may either be made by contact-printing in an ordinary printing-frame, or in the camera; whichever plan is followed, the plates should be carefully dusted before exposure, and of course the time of exposure must depend on the power of your light.

A transparency may be obtained by one second's exposure to a gas-light in a printing-frame, if you hold it within about nine inches of the flame; and if you want a very thin transparency that is the way to get it; a strong light and short exposure will always secure you plenty of detail, great softness, and much weakness. But if you want a rich vigorous transparency for the reproduction of a negative, place the printing-frame further from the light, and give it a much longer time. Remember that light decreases according to the square of the distance: that is, if you have a certain intensity of light at a distance of one foot, it will be four times

less at a distance of two feet, nine times less at a distance of three feet, sixteen times less at a distance of four feet, and so on. Don't suppose that twice the distance will require twice the time, and three times the distance three times as long. Experiment will soon convince you of this. Again I say, prove all things; prove this by actual experiment. Expose four plates under a negative one after the other; let the first be placed about one foot from the light for two seconds, the next two feet from the light for eight seconds, the next three feet from the light for twenty seconds, the next four feet from the light for sixty seconds. Develop all these with the same developer, and keep them labelled for reference; you will see then what a power you have of moulding the character of your transparency to suit your purpose. We find that a negative of average density gives the best transparency by placing it four feet from an argand burner for 60 seconds, and developing with an extra dose of Pyro. We give five grains to the ounce, and six minims of Ammonia and Bromide solution. With this we get as fine a transparency as it is possible to produce by any method published. It takes about ten minutes from first to last; and if a number were required, time could be economised by developing, fixing, and washing several at the same time; an average of two minutes for each would then be ample.

The Ferrous Oxalate can be used for transparencies, and very nice results obtained; but use it quite fresh, and with a few extra minims of Bromide solution with it. *See our New Method, page 51.*





## ON THE USE OF ARGENTIC PAPER.

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The experiments we have made with this paper lead us to anticipate a great future for it. It is a young giant, capable of unlimited powers, and of decidedly revolutionary tendencies, and we should not be in the least surprised if it plays some mischievous pranks with those who do not give it such a welcome as it deserves, but it will do wonders in helping the friendly—it will extend their business, lighten their labour, and fill their pockets. One feels almost afraid of saying what it can do, for it is not pleasant to be suspected of falsehood, and it really seems impossible to state plain matters of fact about this paper without raising a suspicion of gross exaggeration, if not flagrant misrepresentation. I wonder who will believe me when I say that ten thousand prints might be produced in one day by three operators working in concert; yet, I will demonstrate that it can be done easily, and at a cost of a little over a farthing each, and leave a fair profit for the principal.

Who can imagine an enlargement completed at five minutes' notice if you except the washing and drying, and yet, we will undertake to show a 15 by 12 enlarge-

ment from any negative five minutes after it is placed in our operator's hands, and we will undertake to wash and dry and deliver it in fifteen minutes.

Fancy what an enterprising man could do with this power. A fond mamma is delighted with the proofs you have shown of her little darling's portrait; hand the negative to your operator for enlargement, and while you are writing out a receipt or holding with her a little polite conversation, an enlargement is produced with which she will be more delighted. You explain this can be painted in water-colour, finished in black and white, or form the basis of an excellent oil painting. In many cases this manœuvre would secure an order at once. It would be merely setting a sprat to catch a whale.

The Argentic Gelatino-Bromide paper will keep good for years, and it is so subversive of all old ideas on the nature of sensitive paper that it positively improves by keeping. I believe too that it is quite permanent; I have some enlargements more than six years old on this paper, and though they have been subjected to the roughest treatment, and no care taken to protect them from injurious influence, they show no signs of fading. Those who do large numbers of Collodion transfers would find this paper an excellent substitute. It can be painted on at once in oils without any preparation, and the character of the picture is so perfect and beautiful that those who use it will find their work take higher rank at once. Every sheet is equal, and as a fixed light of standard intensity can be used the exposure would always be the same and failure scarcely ever occur. It would be easy for a man to do as many



enlargements in one hour as he would get through in the longest day with Collodion.

There is an important feature in all emulsion processes which is of peculiar value in this connexion. The sensitive film is absolutely identical in every plate and sheet of paper, whereas, in the bath every film is of slightly different power. For commercial work this regularity is the great desideratum, and in the Argentic paper you have it associated with the highest sensitiveness, giving rapidity and certainty. Hence, we believe that a large business can be done by the photographer in illustrating trade circulars, much of the work which the lithographer and wood-engraver have had to themselves can now be undertaken in a very superior style by the photographer. I said ten thousand prints could be produced in one day by three operators, and such demands will very speedily be made for illustrating books and catalogues when once it is known that large quantities can be produced very cheaply; and as some may be sceptical on this point, I will describe the way in which I should set about the accomplishment of such a feat. I should direct each of the operators to make a transparency from the one negative I have to get such a multitude of prints from. This would occupy fifteen minutes, as I should dry them off by means of methylated spirit as described before; each man would have sixteen picked plates given him to expose to gaslight under his transparency in a printing-frame. This would occupy half-an-hour, all sixteen plates would be developed at the same time in one large tray, and fifteen minutes would suffice for fixing and washing; allow

half-an-hour for drying. When this is done, I have forty-eight negatives all exactly alike, they need not be varnished.

These forty-eight negatives would all be on patent plate-glass of the same thickness, and I should have them all arranged in one large frame, six rows, eight in a row, on a strong piece of plate-glass; a sheet of paper covering the whole of the negatives would be pressed in contact in the ordinary way. One man would expose for one minute to his gas-burner or gas-burners, then take it to the dark room, change the paper, and while one is exposing another is developing, and a third fixing and washing. Thus the printing would go on just as fast as the first man could expose and change the paper. Allowing two minutes for this operation there would be twenty-four prints turned out per minute, this would amount to one thousand four hundred and forty per hour, and seven hours at this rate would do the ten thousand and 80 to boot. I have allowed for no hitch in the machinery in this calculation, but as I have not made a very long day of it, the reader may assign whatever margin he thinks fit on this account.

Many will set this down as a wild dream: they had better try it.

But this wonderful Argentic paper may be used for negatives. We shall supply it in all the usual sizes ready for use. A tourist may take his stock of films in his pocket-book, and find them no greater incumbrance than his ordinary memoranda; but what notes will he be able to take? how copious, how beautiful, and withal as truthful as heaven's own light can make



them; with a walking-stick tripod in his hand, a small camera in one pocket, a stock of Argentic negative paper in another, he can go over moor and mountain, through tangled woods, along the streams, across the meadows, and every scene of striking beauty that arrests his steps can be carried away in his pocket without detaining him longer than a lingering admiring gaze. Besides, dull and dark days can be made cheerful by providing prints of the same for distribution. The sunshine need not be stolen any more for this purpose, it can be put to better use.

It is now time something was said about the development of the paper. The Oxalate developer is most suitable for paper, and it should be in its freshest and prime condition. A moderately quick development should always be aimed at.\* On removing it from the printing-frame immerse for a few seconds in water, transfer it to the developing dish, then look out for appearance of the picture; beware of carrying the development too far. Stop a little short of what may appear to be the right depth of tone, because in fixing the white Bromide of Silver is dissolved out of the picture and consequently the shadows become darker; you will learn after a few trials what allowance to make for this. The picture must be soaked in a saturated solution of Alum, and fixed in a fresh solution of Hyposulphite of Soda. If the purity of the whites appears sullied by the development, give the print a bath of acidulated water, using sulphuric acid in the pro-

\* Ten drops of C Solution per ounce of developer should be used to keep the whites pure.

portion of one of acid to eighty of water. The reason why Pyrogallic Acid development is not so suitable for paper is that the tone is not so pleasant, and if you get the paper stained nothing will remove it without destroying the picture.

## HOW TO PRODUCE PAPER NEGATIVES.

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The paper may be fastened to a thin board by means of drawing-pins or any other contrivance, and placed in the dark slide in the same manner as a plate; exposure, development, fixing, washing, &c., must be exactly the same as for the Argentic plates, though extra care should be taken to avoid fog. Instead of the board a piece of glass may be used. The paper, if immersed in water, will adhere to the glass and lay upon it perfectly flat. It is necessary that the paper should be penetrated by the water, therefore, give it sufficient time. Another plan of using the paper for negatives would be to have it upon rollers in the dark slide, according to Mr. Warnerk's suggestion. A large number of negatives could be taken upon one roll, and the whole developed at leisure. Tourists could avail themselves of this method with great convenience.

After the paper is developed, fixed, and dried, it must be waxed or oiled. The best white wax is rubbed over the back of a negative, and the back of another without wax placed in contact with it, a hot smoothing-iron is then passed over them, and the wax penetrates



the paper of both negatives, making them semi-transparent.

Instead of the wax, castor oil may be used or pale drying oil—these will take 24 hours to dry, but the paper is very transparent, and may be worked upon with a lead pencil with the greatest facility. We shall not be surprised if paper entirely supersedes glass for large negative work.

## DESICCATED EMULSION.

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One of the first, and decidedly the most serious, troubles we had to encounter in the use of Gelatine as a medium for Argentic Salts was its proneness to decomposition. Many expedients were resorted to for arresting it. All the known antiseptics that could be used were tried one after the other, with only partial success. At last it occurred to the writer's mind that as moisture was the great agent of decomposition, the way to stop the evil was to dispel the moisture. Some emulsion was dried up to a pellicle. Here it was in a form light, portable, and incorruptible,—all its sensitiveness retained by the careful exclusion of light. Those who wish to prepare their own plates in small batches, or who wish to apply it to any of the special purposes to which it is so well adapted, will find the Desiccated Emulsion very convenient. For enlargements on opals, canvas, and ivory-type, it is very suitable; and we will now describe the mode of proceeding in each case, commencing with the last.



## IVORY-TYPES.

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These are so called because they are such close imitations of photographs on ivory that they are generally mistaken for the real thing. When well done these exquisite gems are most charming; they are so soft and delicate, and of such a lovely tone, that everybody who sees them is delighted: yet, strange to say, they have never become popular. There is a reason for this. The process was invented by the late Mr. J. M. Burgess, of Norwich, and called by him the Eburneum process; but the original mode of working requires such extreme finesse and so much skill, that though there has always been an eager demand for them wherever they have been introduced, it does not pay to produce them at anything like a reasonable price. The greatest difficulty, however, is now completely vanquished, and photographers in search of an attractive novelty will do well to try the process with the improvements here suggested. We are indebted to Mr. R. Kidd especially for the minute details which contribute so materially to success in this beautiful process. His productions have never been surpassed, if



they have been equalled; and it is his opinion that attention to each particular is necessary to avoid disappointment. We shall not, therefore, make any apology for giving what may appear to be trivial minutiae.

TO MAKE IVORY-TYPES.—Procure a piece of perfect patent-plate glass; the most suitable size is  $8\frac{1}{2}$  by  $6\frac{1}{2}$  in., this will take four cartes-de-visite. After well cleaning, apply to the plate a polishing of beeswax dissolved in pure benzole, five grains of pure wax to one ounce of benzole. Put this lightly on the plate with a tuft of cotton wool, and polish well with flannel. Edge the plate with a solution of pure india-rubber in benzole; this is to keep the film from splitting-off during drying. Next coat the plate with enamel collodion; let it dry. A few minutes will suffice. Then pour the argentic emulsion on the plate; place it to set on a levelling-stand, accurately adjusted; as soon as set it can be removed to any convenient place, but carefully screened from dust. Let it dry spontaneously. When perfectly dry, dust with a soft camel's-hair brush, place it under your negative in a printing-frame and expose, develop and fix as directed for transparencies: in fact, you are making a transparency of the most delicate kind, and there must not be the faintest suspicion of fog, the transparency must be thinner than for reproductions of negatives. When dry, carefully examine, and re-touch with a H.B. blacklead pencil.

Now comes the ticklish part of the process, and the one that gives it its distinctive character, viz., the application of the Ivory Solution. This is made by

taking  $\frac{1}{4}$  lb. of the best French Gelatine (Coignet's Gold Medal it is called); cut it up, and soak it in three-quarters of a pint of water for two hours; then dissolve by a gentle heat.

While this is dissolving, pound one half-ounce of oxide zinc in a mortar with a quarter-of-an-ounce of glycerine and the same quantity of water. This will make a creamy emulsion, which must be poured into the gelatine while hot, and well stirred; but do not forget to filter the gelatine first through two thicknesses of flannel. Add a few drops of carbolic acid, and let the whole stand in warm water for eight hours, to allow all the coarse particles of oxide of zinc to settle. It must then be allowed to set; and when quite a firm jelly, turn it out of your pot, and cut off the top and the bottom of your gelatinized ivory mixture; the middle will be a perfectly homogeneous emulsion, beautifully fine, free from all grit. Dissolve this by a gentle heat; and while this is progressing, return to your transparency, and prepare it to receive a thick coating of the mixture. To do this, you should previously glue strips of tinfoil paper, half-an-inch wide, very neatly round the edge of the plate, so as to form a little dish; let it go about a quarter-of-an-inch on the underside of the plate, so as to hold firmly, and be careful to fasten the corners neatly, and make them watertight. Carefully examine the transparency to remove any particle of dust, or finger-marks. Then place it on your levelling-stand, and pour the ivory mixture over it with a steady stream, so as to avoid air-bubbles. It is best to pour it into the centre, and let it flow of itself to the edges and



corners. As soon as set, remove as before to the drying cupboard. Now screen it carefully from dust, and if you have put the right quantity on, which will be 4oz. for a whole plate, and the temperature of your drying-cupboard is 75 degrees, it will dry in about 48 hours; but do not attempt to hurry it by raising the temperature, or all your work will be undone. Plenty of patience is the grand requisite, and it will be amply rewarded, but the opposite will be signally punished.

Now you cannot tell when this is perfectly dry by its appearance, you must therefore test the hardness of the surface with your thumb-nail, if it is not sufficiently hard to resist an impression, it is not dry. When it is dry coat it with Collodion on the back, put it in the drying-oven or cupboard for a few hours, and then run your knife round the edge of the plate to scrape off the paper, and the ivory-type immediately comes off the plate perfectly flat, and a surface as brilliant as polished silver. It may be trimmed to any size or shape with a pair of scissors.

## TO MAKE ENLARGEMENTS ON CANVAS.

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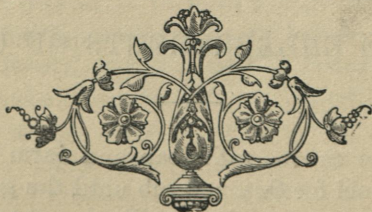
Wash the canvas with soap and warm water, use a piece of flannel for this, and rub until the ground colour begins to come up, then swill the canvas with an abundance of water, let it drain, and afterwards rub

dry with a linen cloth; next, glue strips of stout cartridge paper, about half-inch wide, round the edges of the frame, so as to turn it into a tray; then pour the emulsion on in the proportion of 9 drams to the square foot, put on a levelling-stand to set, and afterwards remove it to the drying cupboard. It is ready at any moment when dry to be exposed and developed. The Ferrous Oxalate developer is best for this purpose, pour it into the tray you have made with the paper, and proceed in every other particular as if developing a plate; but be very careful not to carry development too far, and use plenty of restrainer.

## TO MAKE ENLARGEMENTS ON OPAL.

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Clean and coat exactly as for ordinary glass, and develope as for transparencies. *See page 36.*







# OUR NEW METHOD

OF DEVELOPMENT

BY

FERROUS OXALATE.



The Ferrous Oxalate is comparatively new as a developing agent for dry plates, and has decided merits of its own to recommend it, and since we have been fortunate enough to simplify and immensely enhance the economy of its use—it is likely to become the favourite method. Our discovery came as a surprise to us. We were one dull day, when sitters stayed at home by the fireside, spending an hour or two in our laboratory discussing Ferrous Oxalate, and being disposed in sympathy with the weather to look at the dark side of things, and to give vent to our feelings by a quiet grumble, we saw clearly the defects and shortcomings of Ferrous Oxalate. It was expensive; it was slow; and on a dull day it was difficult for a fellow to see what he was at. There was a long time lost in stirring and mixing, when one suggested that waste of time could be avoided by keeping a large quantity mixed up. But how about its decomposing? queried another. Oh! that difficulty was knocked on the head a long time ago,

our hopeful informed us. A little oil swimming on the top will completely preserve it from atmospheric influence, and therefore prevent decomposition; and Mr. WARNERKE tells us to have a bottle with a glass tap to draw off from the bottom, and leave the oil undisturbed. But we had no bottle with a tap, we determined therefore to do our mixing in a bath. We had a clean transparent glass bath at hand, into that we put our solution of Oxalate of Potash, then upon that some paraffine oil. Oh! horror of horrors! was there ever such a combination in a photographic bath before! through the oil we poured our saturated solution of Sulphate of Iron, and we beheld a beautiful, bright transparent mixture, clear as a ruby, and not a particle of strength had been lost by oxidation, for the oil, like a good sentinel, had shut out the oxygen. Well, so far good, now let us try a plate. One takes the chair, another the camera, and soon we have a plate impressed with the features of the principal of the firm. It is put into the bath swimming with oil and we can see something developing; but what on earth is it? some monster of the cuttle-fish species? We let it go on, and in due time take it out; our plate looks like a map of the Pacific Archipelago, instead of a portrait. The oil had clung to the plate in irregular patches and prevented the action of the developer in certain parts. This produced a chastening sadness for a few moments, then a dead silence, then sundry mild expletives indicative of returning spirits, and at last a suggestion. Why not do as lithographers do? wet the plate to resist the oil. We tried again, and behold, a perfectly clean and regu-



larly developed picture with wonderful pluck in it. The plate goes in clean and comes out clean, passing through the oil without being touched by it; another plate goes in, and then another—each behaves perfectly, when all of a sudden an exclamation of surprise—a new idea! This developing fluid is just the colour of our window, it is more transparent. Bring it out into the open, says one of us; let us see what will happen, why nothing but the regular development of the plate, no fog, no fumbling. It is a dull day, never mind, we can see what we have never seen before, we can do what has never been done before—we can develop a plate in the open air. Not a bad day's work, we thought, and the more we thought the more pleasing what we had done appeared. There was a great saving of time, no mixing-up of a developer each time; simply putting it in the bath was all. There was a saving of money, for we have developed more than fifty half-plates in the same bath without any sign of deterioration; 75 per cent. would have gone down the sink. There was a saving of eye-sight; the ruby light is so trying to some eyes, that they cannot use it without pain and danger; this will reduce the danger to a minimum. One half-minute is all any one need spend at a time in the dark room. The plate once in the bath, it can be taken to any convenient place to complete the operation of development; and from the clearness with which it can be seen, there will be more satisfactory results obtained, and this will be the best-paying part of the improvement to professional men.

The bath we first made more than six weeks ago

is still in use; and though getting weak and working slowly, it answers admirably for copying, giving just the kind of negative it is difficult to get by the other mode of development. We have now set this old bath aside for this purpose. A hint to the wise is sufficient. I need not expatiate upon the special advantages of keeping developing-baths of different stages of exhaustion; for it will be seen at a glance that if a new bath gives fulness of detail and softness, and an old one gives powerful contrasts and great density, the possession of baths of different degrees of activity will give the operator the power of modifying the character of the negative at pleasure.

Our new method of development may be applied to paper, and serves admirably for enlargements or negatives. The paper must be thoroughly saturated with water, then pinned to a thin board, and lowered on the dipper into the bath; there need be no fear of the oil touching the paper if it is well wetted. Take care not to carry the development too far. Use the Alum, Hypo, and an abundance of water as before directed.





## MEMORANDA.

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Over exposure is one of the principal causes of failure. Never condemn the plate you are using until you are quite sure you have not erred in this direction.

Do not wet the plate before development as it is detrimental to vigour.

Master one mode of development and stick to it.

Pyrogallic developed negatives look weaker than they are.

Ferrous Oxalate negatives look much stronger than they are.

In warm weather use more Bromide of Potassium and Pyrogallic Acid and less Ammonia.

Handle your plates by the edges, beware of touching the film with hot or moist hands.

A too strong solution of Hypo promotes blisters and retards fixing.

Never omit to use the Alum bath, it may do good, it cannot do harm.

A small nail brush is handy to clean the back of the plate.

Carefully stop your Ammonia bottle.

Be sure the negative is quite dry before applying heat.

Do not take your negative to the light until the Hypo is thoroughly washed off. Do not spare the water.

**SILVER INTENSIFIER**—Pyrogallc Acid 1 grain ; Citric Acid 2 grains ; Distilled Water 1 ounce. A few drops of a 20-grain solution of Nitrate of Silver in distilled water is added just before using, and if enough density is not obtained before the intensifier becomes muddy, it must be thrown away, and some fresh applied.

**BICHLORIDE OF MERCURY INTENSIFIER**—Put the plate into a saturated solution of Bichloride of Mercury until the picture is bleached, then wash well and apply a weak solution of Ammonia. Five or six drops of Ammonia to the ounce of water, repeat this if necessary, washing well between each operation.

